

TITLE: IMPROVING YOUR IMAGE WITH COMPUTER GENERATED GRAPHICS

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MASTER

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Session 21A
Data Base and Business Products Committee
Title: Improving Your Image With Computer
Generated Graphics
Speaker: Ronald Hults

Visual aids can enhance a presentation by getting and keeping your audience's attention; they can also put your audience to sleep. Too often, visuals are an afterthought--hastily drawn vugraphs with little consideration given to what the speaker is actually trying to say or so crammed with details that only the speaker can read them. A partial solution to this problem is to use computer-generated graphics. At LASL, many of us use a program called MAPPER (which I describe later) to produce presentation-quality graphics. However, to effectively use a program such as MAPPER, you need to understand some of the philosophy behind visuals and the types of visuals that are most appropriate and most easily developed.

When preparing a presentation you must be aware that people are visual-minded. We have been visually oriented from birth. People grow up surrounded by the visual influences of television, movies, books, school blackboards, and many other kinds. When we use visuals, memory retention is increased. When relying on verbalization alone to communicate, an estimated 90% of a message is misinterpreted or forgotten entirely. We retain only 10% of what we hear! Adding appropriate visual aids to verbalization increases retention to approximately 50%. In addition, by both seeing and hearing the message simultaneously, people can understand the speaker's intent easier and quicker. Misinformation can be effectively avoided and misunderstandings are less likely to occur.

Some other reasons for visual aids are to:

- save time,
- increase interest,
- generate and hold attention,
- clarify an idea,
- reinforce or emphasize an idea,
- prove a point.

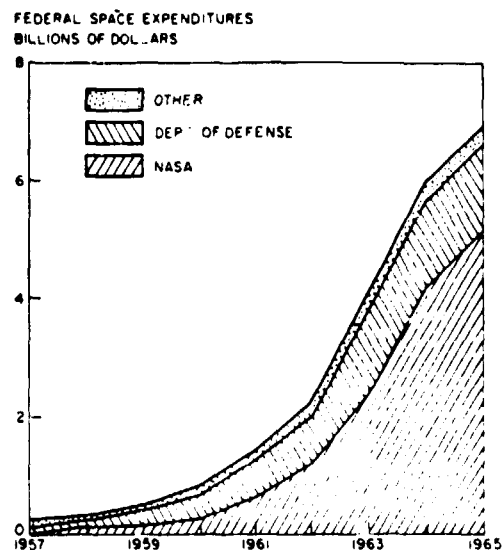
In other words, visual material must get and hold attention, and have a basic structure and unity. It must have simplicity, just as writing or speaking must. Although it uses both conscious and subliminal emotional appeal, it must be appropriate and concrete; it must follow most of the rules for making meaning clear. In short, visual aids or whatever you choose to call them--whether they invoke the senses, emotions, or intellect--are a form of communicating and as such are governed by all the fundamental principles of conveying a message. The basic rules for effective visuals are:

1. Visual images must be large enough for the audience to see easily.
2. They must be easy to understand. **KEEP THEM SIMPLE!** The less copy, the better the visual.
3. Visuals must be created to highlight, reinforce, and add to your commentary.

For technical presentations, charts have long been recognized as the clearest and most effective method of interpreting and presenting a subject visually. Of equal or even greater importance is the fact that such a chart can also clarify a complex problem. It can reveal hidden facts that were not obvious from the original data.

Figure 1 gives a clear difference of the same data provided first in a tabular form and then with graphics.

I believe it is clear which one is more understandable. There are many types of charts and I will briefly describe some of the more commonly used ones.



Federal Space Program Expenditures*

Agency	1957	1960	1963	1966 est.	1967 est.
National Aeronautics and Space Administration	76	329	5,035	5,521	5,211
Department of Defense	48	518	1,592	1,640	1,650
Atomic Energy Commission	19	41	232	201	174
Weather Bureau	--	--	24	19	27
National Science Foundation	7	--	3	4	3
Total	150	888	6,886	7,384	7,064

* In millions of dollars.
-- represents zero.

Figure 1

Figure 2 shows a milestone chart. The milestone chart is one of the most basic and perhaps the most useful of all charts used in commercial communications. It depicts schedules and schedule histories by showing scheduled events (goals) on a time scale.

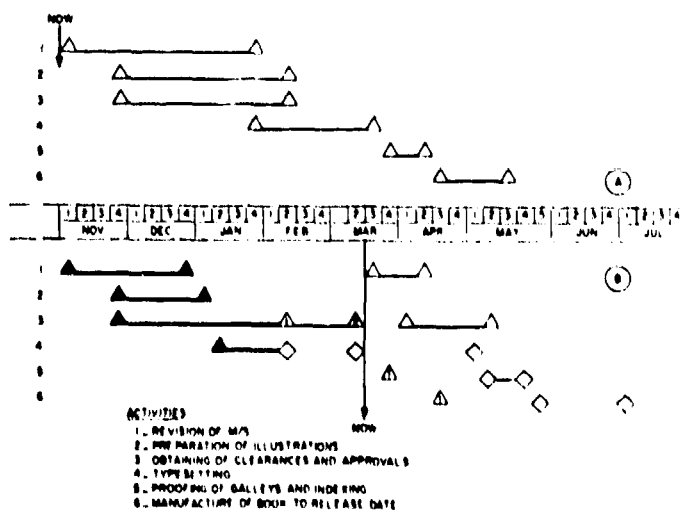


Figure 2

Column charts (Fig. 3) are used for showing discrete quantities in discrete periods; for example, sales per month, tons per quarter, gallons per hour. The "independent variable," measured along the horizontal axis, is almost always a unit of time. The "dependent variable," expressed by the height of the column, that is, measured along the vertical axis, can be anything that can be measured and expressed as a quantity--dollars, tons, carloads. The column charts convey at a glance what statistics convey only through intellectual interpretation: period-to-period comparison measured quantities.

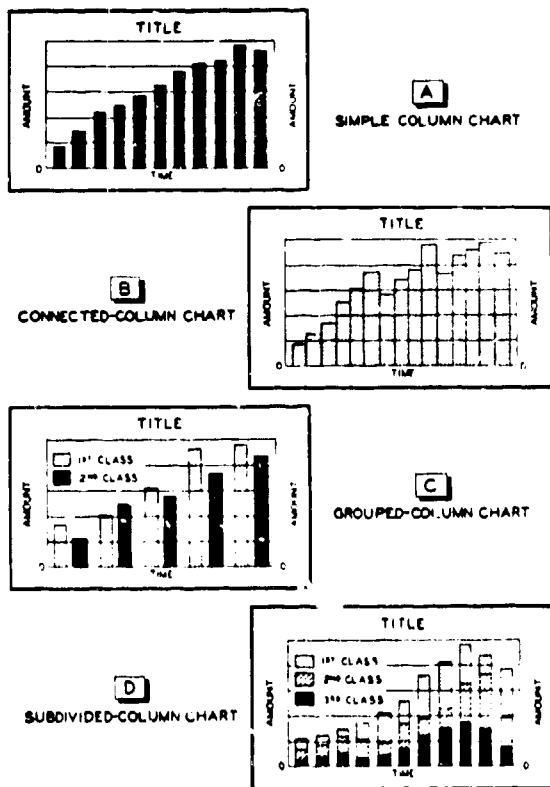


Figure 3

Bar charts (Fig. 4) are ideal for comparing large numbers of different categories, whereas other types of charts are oriented more toward representing value versus time for single, or at least relatively few, categories.

Bar charts differ from column charts in that the values to be displayed and compared are plotted horizontally instead of vertically. The decision on which type to use hinges on which is easier to draw in the available space--which is less cluttered and hence more pleasing to the eye.

Line charts (Fig. 5), unlike the column and bar charts, show discrete totals and continuity. They thus convey a greater sense of movement and rhythm than do bar charts. In business reports, line charts are used frequently to show cumulative values, such as units shipped or dollars expended. A solid line is conventionally used for actual values, and a broken or dotted line for projected and anticipated values.

Band charts are somewhat similar to line charts, except that the area below the topmost line (which represents the total) is subdivided into bands, or strata, each representing a subtotal. As you can see from

Fig. 6, a band chart of related values makes for a very effective comparison.

Pie charts (Fig. 7) are generally considered the easiest to read of all types of charts. They are limited, however, to showing percentages of the whole.

Rate charts, also called ratio charts, are used to compare the rate of change of two or more grossly unequal quantities. For example, to make a graphic comparison of the 1974 fluctuations in the stock of IBM, ranging from 254 to 150, and ITT, ranging from 29 to 13, would be totally misleading if the two price movements were plotted on an arithmetic (evenly divided) scale

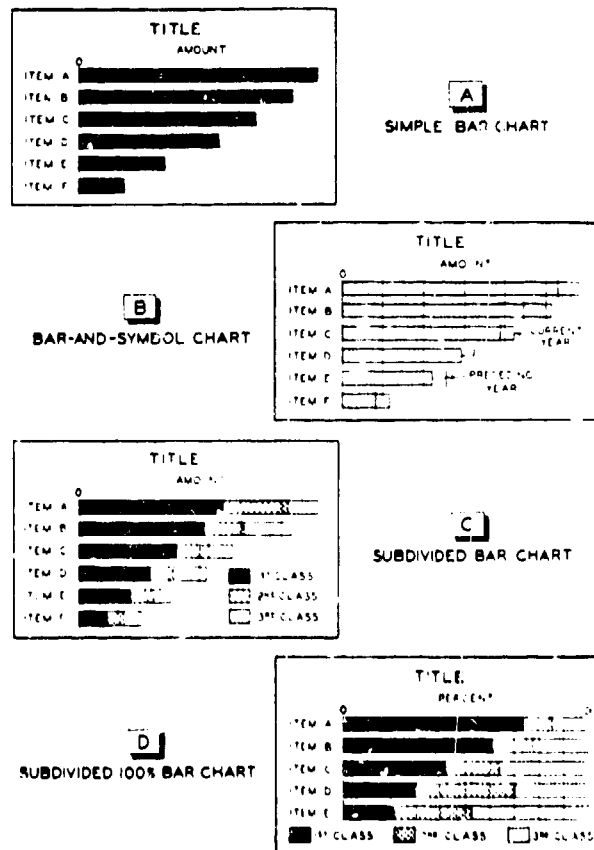


Figure 4

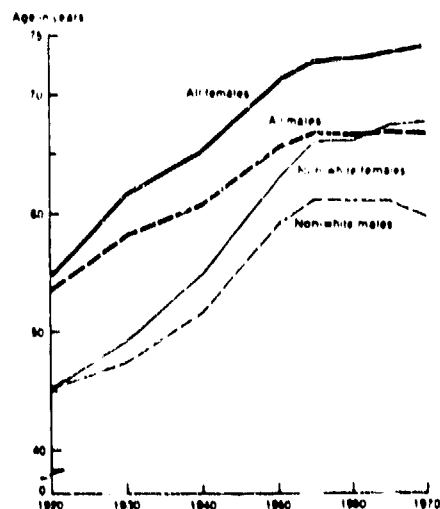


Figure 5

(Fig. 8). To make a realistic comparison it would be necessary to use a logarithmic scale where the divisions, as on a slide rule, get smaller as the value gets larger.

Figure 9 illustrates how the rate scale eliminates distortion by using semi-logarithmic paper for plotting curves representing unequal magnitudes.

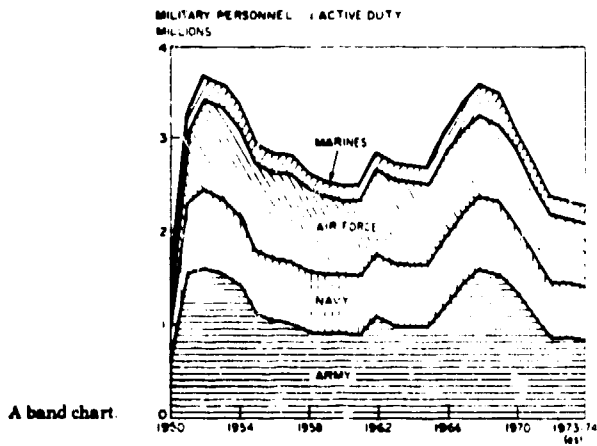


Figure 6

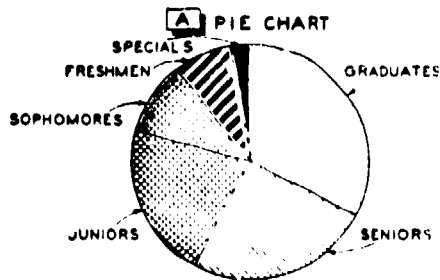


Figure 7

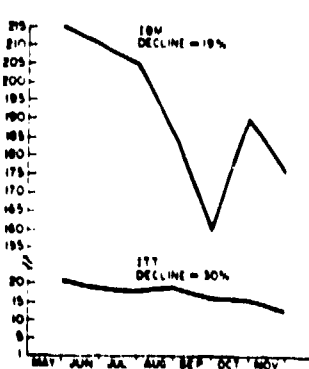


Figure 8

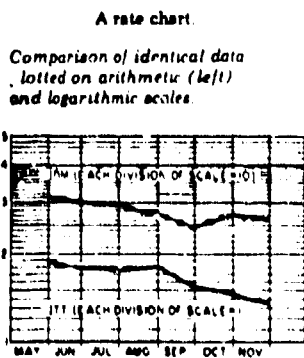


Figure 9

MAPPER

MAPPER was written by David Dahl and Kenneth Rea of LASL's Health Division for use in their Division. It soon became so popular that the Computer Science and Services Division picked it up and is providing it to all the users of the Central Computing Facility.

MAPPER is easy to learn. The user with no previous programming experience can output slides, graphs, charts, tables, and maps to both color and black and white microfilm, and to Tektronix terminals. MAPPER can also be used to make 16-mm color movies.

MAPPER is written in Fortran and is a front end to the DISSPLA package, a proprietary software product of ISSCO. It reads English language based command files that the user has generated. An interactive editor allows Tektronix users to add features on the scope and have the additions automatically added to the command file. The Tektronix graphics tablet can be used to generate command files directly.

MAPPER can draw boxes, circles, ellipses, and complex line segments in a wide variety of line format characteristics. There are 6 types of label commands and 12 lettering styles to cover the spectrum of labeling requirements. Label options include manual sizing and locations, two forms of automatic sizing and location, flexible string control, label rotation, extensive justification control, and multiple line capabilities. The user has a wide choice of color control through the use of three different commands, and special features permit selective shading of specific areas. Symbols may be defined, located, sized, distorted, and shaded as desired. Additional features include the LASL logo, skipping, multilevel rotating projection parts, contouring, three types of file subroutines, movie-generating commands, and Fortran support capabilities.

SUMMARY

Computer-generated graphics can improve your image, however, they must be

- easily read and understood,
- simple and uncluttered, and
- pertinent to your presentation.

The software package you use for generating graphics should

- be easy to use (simple word commands),
- be easy to learn (limited number of commands),
- have wide utility (logically interlinking commands), and
- inspire creativity (powerful options).

ACKNOWLEDGMENTS

I wish to thank Hayden Book Company, Inc., for their permission to reproduce the figures used in this paper.